APPENDIX 4-A

STORAGE OF FERROCOLUMBIUM

1. *Description*. Ferrocolumbium (ferroniobium) is a heavy metallic alloy, silvery in color, consisting principally of columbium (niobium). It is primarily used in high temperature, stainless, carbon, and other alloy steels. Ferrocolumbium may be received in any one of three grades (A, B, C or E), and two separate sizes (I or II). When acquired, it shall meet Purchase Specification P-104-R1 (Current Edition). Ferrocolumbium, superalloy grade (A-R2) shall meet Purchase Specification P-104-R2 (Current Edition).

2. *Packaging*

a. New receipts will be packaged in 30-gallon, 16 gauge steel drums, conforming to the National Stockpile Container Specification C-1 (latest revision). The bolts and nuts used to hold the locking ring shall be corrosion resistant. Bulk net weight ranges from 1,000-1,250 lbs.

b. Ferrocolumbium of other grades presently in storage and in other type or size containers shall not be repackaged without prior authorization and covering specifications from the DNSC-OL.

3. *Marking*

a. Each drum shall be tagged with a 3” x 5” aluminum tag. Tags are to be adhesively attached to each flat side of the lid and one to the outer side wall of the drum midway between the locking ring and the upper rolling hoop. The following information shall be embossed on the tags:

(1) Name of Product

(2) Name of Producer

(3) Country of Origin

(4) Gross and Net Weights

(5) Grade and Size

(6) Government Contract Number

(7) Lot Number

(8) Drum Serial Number (e.g. 1/20, 2/20, etc.)

(9) % Cb - % Ta

(10) Duplicate Tag Inside

b. Identification of material shall be obtained from information shown on documents accompanying each shipment and on shipping instructions issued by the DNSC-OL. The DNSC-OL shall be notified

APPENDIX 4-A

STORAGE OF FERROCOLUMBIUM

immediately if shipments are received without identifying marks, or if the markings are not in agreement with those shown on the documents and/or shipping instructions.

4. *Storage*

a. Material in other than approved type galvanized steel drums shall be stored in a warehouse, shed, or other structure, so as to protect the containers from the weather. Material received in hot-dipped galvanized drums, conforming to National Stockpile Container Specification C-1 (latest revision), may be stored in the open on concrete runners or blocks, when specifically authorized by the DNSC-OL.

b. Storage identity shall be maintained by contract, lot number, grade, and size indicated on each container and in shipping instructions. Material received prior to this change may be stored by contract and lot only. This shall not be rewarehoused unless authorized by the DNSC-OL.

c. When material is to be stored in a warehouse, shed, or other structure, the first tier of drums shall be placed on 4'x 4' hardwood runners or floor pallets in an upright position, after which 1-inch thick random length and width hardwood dunnage lumber shall be used between each succeeding tier. If the use of dunnage lumber between tiers is not practical because of weight of containers, or difficulty in handling, pallets between tiers may be used. Main transportation aisles shall not exceed that required for the efficient operation of local material handling equipment. A complete description of each lot shall be indicated on a card which shall be prominently displayed and securely attached to each lot in the stack. DNSC storage sites will use the Warehouse Materials Identification Card (DNSC Form 41) for this purpose. Forms which are specifically designed for use with stockpile material will be furnished to military depots upon request.

d. When material in galvanized drums is designated for storage in the open, drums shall be stored on their sides and stacked in cordwood fashion on concrete runners or blocks. The space utilized shall be equivalent to Type B or better, as described in Chapter 4, and be capable of sustaining a load of not less than 2,000 pounds per square foot. Drum storage areas should be laid out with emphasis on maximum occupancy, since no rotation handling is expected. When stored in the open, the joint of the locking ring that holds the head on the drum should always be at the bottom. Storage aids to keep drums stable shall be of concrete. Use of cinder block for this purpose is prohibited. Arrangements for concrete runners or concrete blocks and other storage aids will be made by the DNSC-OL, and established as a Special Project.

e. Maximum stacking height of drums stored in open space will be two, and maximum width of a storage block will be four drums, unless otherwise directed by the DNSC-OL. Inspection aisles of not more than 3 feet shall be provided between storage blocks, and main transportation aisles shall not exceed that required for the operation of local handling equipment. Each lot should be stored so that it is readily accessible for outshipment. Lots may be stored in adjacent rows within the block, and a row may contain parts of two lots, provided each lot is readily accessible by use of overhead handling equipment.

APPENDIX 4-A

STORAGE OF FERROCOLUMBIUM

f. Whether stored in a warehouse, shed, etc., or in the open, the drums shall be stored in uniform rows and tiers so as to facilitate the taking of an inventory at any time by counting the rows and tiers and computing the total quantity. In doing this, however, economical use of space must be given full consideration, and all segregation and other requirements must be met. When pallets are used, a uniform number of drums shall be placed on each pallet, except when an odd number on the top pallet of a stack of uniform height will complete the lot.

g. Each depot will maintain a locator or plot map system covering drummed material stored in the open. The system utilized should be so developed that ready identification can be made at any time, as indicated herein (Paragraph 4b), for maintenance of identity in storage.

5. *Precautions To Be Taken*

a. *Health*. When handling drummed material, there are no health precautions other than normal safety practices. However, during repackaging of ferrocolumbium or when handling loose material, should there be any dust from the material, all workers potentially exposed to such dust shall wear respirators of a type approved for this purpose by the NIOSH.

b. *General*. Rough handling may cause extensive damage to the galvanized coating on the drums. When discovered, all abrasions and/or scratches shall be coated with a zinc base paint prior to placement of drums in permanent storage. Proper care shall be exercised in handling drums in order to avoid damage. Upon receipt, drums should be carefully checked to insure that the lids are securely fastened.

6. *Average Storage Factor*

a. *Volume*. 7 cubic feet per net short ton.

b. *National Stockpile Average Square Foot Occupancy*. Warehouse - 5.5 gross square feet per short ton.

FOR ADDITIONAL INFORMATION ON THIS COMMODITY REFER TO THE MATERIAL SAFETY DATA SHEET OR THE MOST RECENT PURCHASE SPECIFICATION.